UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/980,443	08/08/2002	Hong Lye Oh	851663.432USPC	3555

500 7590 02/23/2007 SEED INTELLECTUAL PROPERTY LAW GROUP PLLC 701 FIFTH AVE SUITE 5400 SEATTLE, WA 98104	**EXAMINER** HUBER, JEREMIAH C

ART UNIT	PAPER NUMBER
2621	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/23/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

PTOL-90A (Rev. 10/06)

	Application No.	Applicant(s)
Office Action Summary	09/980,443	OH ET AL.
	Examiner	Art Unit	
	Jeremiah C. Huber	2621	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>06 February 2006</u>.

2a)☒ This action is **FINAL.**   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-20</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-20</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on <u>13 May 1999</u> is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)
2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3)☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4)☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5)☐ Notice of Informal Patent Application (PTO-152)
6)☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2.   Claims 1-2, 4-5, 7-8, 10, 16 and 18 are rejected under 35 U.S.C. 102(b) as being

anticipated by Morgan et al (GB2308774) for the same reasons as set forth in the

previous action dated 5/16/2006.

In regard to claim 1 Morgan discloses a method for motion estimation for use in a

moving pictures sequence wherein data representing the picture in the sequence

comprises a plurality of data blocks (Morgan Fig. 1) that includes selecting a group of

related data blocks from the plurality of related data blocks of the picture (Morgan page

8 line 33 to page 9 line 7), for each data block in the selected group obtaining a

corresponding block motion vector from a previously processed picture in the moving

pictures sequence (Morgan page 8 line 33 to page 9 line 19), classifying the block

motion vectors from the selected group into a plurality of sub-groups and determining a

primary and a plurality of secondary global motion vectors corresponding to block

motion vectors (Morgan page 9 line 31 to page 10 line 25 and page 13 line 24 to page

16 line 5) and selecting the primary and or secondary motion vectors for use in defining

one or more search windows for each block in the selected group to enable block

matching with a reference picture (Morgan page 10 line 24 to page 11 line 8).

In regard to claim 2 refer to the statements made in the rejection of claim 1
Morgan further discloses grouping by a spatial clustering technique (Morgan page 15
lines 14-19).

In regard to claim 4 refer to the statements made in the rejection of claim 1
above. Morgan further discloses determining a match between each block in the
selected group and a matching block in one or more search windows for that block in
the reference picture and determining a computed motion vector between each block in
the selected group and its matching block (Morgan page 10 line 26 to page 11 line 8).

In regard to claim 5 refer to the statements made in the rejection of claim 4
above. Morgan further discloses storage of motion vector data (Morgan page 15 lines 6
–14).

In regard to claim 7 refer to the statements made in the rejection of claim 1
above. Morgan further discloses analyzing the distribution of global motion vectors and
selecting a motion estimator scheme on the basis of a distribution metric (Morgan page
10 line 26 to page 11 line 8, page 12 line 31 to page 13 line 8 and page 16 lines 25-28).

In regard to claim 8 refer to the statements made in the rejection of claims 1 and
7 above.

In regard to claim 10 refer to the statements made in the rejection of claims 1 and
8 above.

In regard to claim 16 refer to the statements made in the rejection of claims 1 and
8 above.

In regard to claim 18 refer to the statements made in the rejection of claims 1 and

10 above.

Claim Rejections - 35 USC § 103

3.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4.   Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Morgan.

In regard to claim 20 refer to the statements made in the rejection of claim 1

above. Morgan discloses a uniquely addressed frequency array for determining global

motion vectors in which candidate global motion vectors are updated for each block

motion vector that is classified with the candidate global motion vector (Morgan page 15

line 5 to page 16 line 5). It is noted that Morgan does not disclose details initial values

for the frequency array, however it is inherent that elements in frequency array

disclosed by Morgan will have some initial value and the examiner takes official notice

that it would have been obvious to one of ordinary skill in the art at the time of the

invention initialize all of the values, including whichever candidate global motion vector

array indices become primary and secondary global motion vectors, to zero in order to

accurately represent the frequency of occurrence of each vector.

Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Morgan in

view of Prakash et al (6600786).

Prakash is cited in response to applicant's request for evidence to support official

notice of obviousness to include elements that were common and notoriously well

known in the art at the time of the invention.

Morgan discloses a motion estimation method as stated in the rejection of claim

1 above. Morgan further discloses representing a group of motion vectors by the most

frequently occurring motion vector for a group of motion vector candidates within a

certain spatial distance (Morgan page 15 lines 14-19). It is noted that Morgan does not

disclose computing global motion vectors as averages. However, Prakash discloses a

method of determining a characteristic motion vector in which the characteristic motion

vector is the can be the average motion vector of a corresponding group (Prakash col.

11 lines 45-62). It is therefore considered obvious that one of ordinary skill in the art at

the time of the invention would recognize the advantage of incorporating group

averaging, as disclosed by Prakash to represent the group of motion vector candidates

in Morgan, in order to reduce the amount of motion related information as suggested by

Prakash (Prakash col. 11 lines 45-62).

5.   Claims 6, 9, 17 and 19 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Morgan in view of Yagasaki et al (5428396) for the same reasons as

set forth in the previous action dated 5/16/2006.

In regard to claims 6, 9, 17 and 19, Morgan discloses a motion estimation method as argued in the rejection of claims 1, 8 and 10 above. Morgan further discloses processing based on motion vector length (Morgan page 14 line 21 to page 15 line 4). It is noted that Morgan does not disclose details of variable length coding (VLC). However, Yagasaki discloses a method VLC for motion vectors that adapts to optimally fit a given range of motion vectors (Yagasaki col. 8 line 26 and col. 9 line 8). It is therefore considered obvious that one of ordinary skill in the art at the time of the invention would recognize the advantage of including in Morgan a VLC coding method as taught by Yagasaki in order to reduce space necessary to store the video data.

6.   Claims 11-12 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Morgan in view of Mizuno (6249550) for the same reasons as set forth in the previous action dated 5/16/2006.

Morgan discloses a motion estimation method as stated in the rejection of claims 1 and 8 above. It is noted that Morgan does not disclose details of multiple motion estimators. However Mizuno discloses a motion estimation method that uses two motion estimators in order to process field based video (Mizuno fig. 11 and col. 18 line 63 to col. 19 line 43). It is therefore considered obvious that one of ordinary skill in the art would recognize the advantage of including plural motion estimators as taught by Mizuno in the invention of Morgan in order to process field based video.

In regard to claim 12 refer to the statements made in the rejection of claim 11 above. However, Mizuno further a method wherein the search range is determined based on stored motion vector data (Mizuno col.9 lines 6-11).

In regard to claims 14 refer to the statements made in the rejection of claims 1 and 8 above.

7.	Claims 13 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Morgan in view of Mizuno as applied to claim 11 above, and further in view of Yagasaki for the same reasons as set forth in the previous action dated 5/16/2006.

The modification of Morgan in view of Mizuno does not disclose details of variable length coding (VLC). However, Yagasaki discloses a method VLC for motion vectors that adapts to optimally fit a given range of motion vectors (Yagasaki col. 8 line 26 and col. 9 line 8). It is therefore considered obvious that one of ordinary skill in the art at the time of the invention would recognize the advantage of further modifying Morgan in view of Mizuno to include a VLC coding method as taught by Yagasaki in order to reduce space necessary to store the video data.

In regard to claim 15 refer to the statements made in the rejection of claims 11 and 13 above.

Response to Arguments

8.	Applicant's arguments filed 11/16/2006 have been fully considered but they are not persuasive.

As an initial matter the examiner notes that due to an oversight the rejection of claims 18 and 19 was omitted from the previous office action. However, the claims recite only limitations that were present and previously addressed in other claims and the rejection would have remained the substantially the same. Therefore, the examiner believes that this represents no additional burden to the applicant.

In response to the applicant's arguments in regard to claim 1, the applicant asserts that Morgan fails to disclose determining a primary global motion vector, nor does Morgan disclose determining a plurality of secondary global motion vectors. The examiner must respectfully disagree. Morgan discloses determining a set of global motion vectors based on frequency of occurrence and other criteria, such as that the global motion vectors must differ from each other by a certain amount (Morgan page 13 line 24 to page 16 line 5). Morgan also discloses ranking motion vectors by frequency of occurrence (Morgan page 13 lines 28-29). The examiner acknowledges that Morgan never specifically qualifies any motion vector as the "Primary" global motion vector. However, the only definition offered by the claim as to what constitutes the "Primary" global motion vector is that that it is derived from all corresponding block motion vectors. Therefore, examiner believes that the highest ranked, or most common, motion vector is clearly the Primary motion vector as it corresponds to all of the block motion vectors.

In regard to the plurality of secondary global motion vectors, Morgan also discloses up to 7 other (8 total) global motion vectors (Morgan page 16 lines 3-5). While these global motion vectors cannot be said to correspond to all the motion vectors

because they are not the most common, they do correspond to certain sub-groups of

motion vectors that differ from the most common vector by a certain amount.

As an initial matter the applicants arguments in the first paragraph of page eleven

recite that Morgan fails to disclose the limitations of claim 1. The examiner believes this

to be a typographical error and that the intention was to be arguing the limitations of

claim 7 because claim 1 does not contain the limitations argued further in the

paragraph. In response to further arguments made by the applicant in regard to claim 7

the applicant further asserts that Morgan fails to disclose plural motion estimation and

search schemes or any selection between such schemes. The examiner must

respectfully disagree. Morgan discloses a motion vector reducer (Morgan 220) used in

combination with a motion vector selector (230) (Morgan page 10 line 10 to page 11 line

8). The motion vector reducer selects three candidate motion vectors which pass a

confidence test. These vectors are selected from a local motion vector, a neighboring

motion vector and global motion vectors. However, since it is possible that any of these

vectors may not pass the confidence test any of various combinations of motion vectors

could be passed to the selector. For example, the local motion vector and two global

motion vectors could be selected, if the neighboring motion vector fails the confidence

test, alternatively three global motion vectors could be selected if both the local and

neighboring motion vector fail the confidence test. Further, Morgan discloses a global

motion vector restrictor (Morgan 340) as part of the motion vector reducer that may

prevent certain global motion vectors for being assigned to a given block, therefore

there are various motion vector combinations that can be selected form the global motion vectors themselves.

The motion vectors are then passed to the motion vector selector which performs a variety motion estimation and search schemes that involve detecting correlation between test blocks at each given motion vector, however the motion estimation and search scheme will differ for every combination of motion vectors as each motion vector will generate a different set of test blocks related to different portions of reference image. Therefore the examiner believes that the cited portions of Morgan do constitute selecting between various motion estimation and search schemes.

In regard to applicant's arguments specifically directed to claim 8, the applicant asserts that Morgan fails to disclose determining a plurality of global motion vectors formed from a plurality of corresponding block motion vectors. The examiner must respectfully disagree. Morgan discloses determining a plurality of global motion vectors from block motion vectors by selecting the most commonly used, or highest frequency block motion vectors as candidates for global motion vectors (Morgan page 13 line 14 to page 16 line 5). Therefore the global motion vectors are formed by a plurality of motion vectors that all have the same magnitude and direction. The applicant seems to assert that in order for the global motion vector to be "formed" from a plurality of block motion vectors, it must be the average of those vectors, however this is not stated in the claim. The examiner would further point out that given uniform motion in a frame, such that all block vectors are equal the global motion vector selected by Morgan would also be the average motion vector.

In response to applicant's arguments in regard to claim 3 the applicant asserts

that the provided motivation to use motion vector averaging in the invention of Morgan

is insufficient. The examiner must respectfully disagree, and has cited Prakash in

support of official notice.

The applicants arguments regarding the additional claims contain similar

arguments to those made in regard to claims 1 and 7, and the examiner believes the

arguments regarding these claims are appropriately answered by the responses above.

Conclusion

`THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time

policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later

than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Jeremiah C. Huber whose telephone number is

(571)272-5248. The examiner can normally be reached on Mon-Fri 8:00 a.m. - 4:30

p.m..

  If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Mehrdad Dastouri can be reached on (571)272-7418. The fax phone

number for the organization where this application or proceeding is assigned is 571-

273-8300.

  Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free).

Jeremiah C Huber
Examiner
Art Unit 2621

YOUNG LEE
PRIMARY EXAMINER